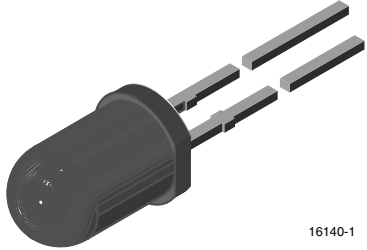


## Silicon PIN Photodiode, RoHS Compliant



16140-1

### DESCRIPTION

BPV10NF is a PIN photodiode with high speed and high radiant sensitivity in black, T-1 $\frac{3}{4}$  plastic package with daylight blocking filter. Filter bandwidth is matched with 870 nm to 950 nm IR emitters.

### FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm):  $\varnothing$  5
- Leads with stand-off
- Radiant sensitive area (in mm<sup>2</sup>): 0.78
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- High bandwidth: > 100 MHz at  $V_R = 12$  V
- Fast response times
- Angle of half sensitivity:  $\varphi = \pm 20^\circ$
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### APPLICATIONS

- High speed detector for infrared radiation
- Infrared remote control and free air data transmission systems, e.g. in combination with TSFFxxxx series IR emitters

| PRODUCT SUMMARY |               |                 |                      |
|-----------------|---------------|-----------------|----------------------|
| COMPONENT       | $I_{ra}$ (mA) | $\varphi$ (deg) | $\lambda_{0.5}$ (nm) |
| BPV10NF         | 60            | $\pm 20$        | 790 to 1050          |

**Note**

Test condition see table "Basic Characteristics"

| ORDERING INFORMATION |           |                              |                   |
|----------------------|-----------|------------------------------|-------------------|
| ORDERING CODE        | PACKAGING | REMARKS                      | PACKAGE FORM      |
| BPV10NF              | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |

**Note**

MOQ: minimum order quantity

| ABSOLUTE MAXIMUM RATINGS            |  |            |               |                  |
|-------------------------------------|--|------------|---------------|------------------|
| PARAMETER                           | TEST CONDITION                               | SYMBOL     | VALUE         | UNIT             |
| Reverse voltage                     |  | $V_R$      | 60            | V                |
| Power dissipation                   | $T_{amb} \leq 25^\circ\text{C}$              | $P_V$      | 215           | mW               |
| Junction temperature                |  | $T_j$      | 100           | $^\circ\text{C}$ |
| Operating temperature range         |  | $T_{amb}$  | - 40 to + 100 | $^\circ\text{C}$ |
| Storage temperature range           |  | $T_{stg}$  | - 40 to + 100 | $^\circ\text{C}$ |
| Soldering temperature               | $t \leq 5$ s, 2 mm from body                 | $T_{sd}$   | 260           | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Connected with Cu wire, 0.14 mm <sup>2</sup> | $R_{thJA}$ | 350           | K/W              |

**Note**

$T_{amb} = 25^\circ\text{C}$ , unless otherwise specified

| BASIC CHARACTERISTICS               |   |                 |      |                     |      |  |
|-------------------------------------|---|-----------------|------|---------------------|------|--|
| PARAMETER                           | TEST CONDITION  | SYMBOL          | MIN. | TYP.                | MAX. | UNIT                                   |
| Forward voltage                     | $I_F = 50 \text{ mA}$   | $V_F$           |      | 1.0                 | 1.3  | V                                      |
| Breakdown voltage                   | $I_R = 100 \text{ }\mu\text{A}, E = 0$                                  | $V_{(BR)}$      | 60   |                     |      | V                                      |
| Reverse dark current                | $V_R = 20 \text{ V}, E = 0$   | $I_{ro}$        |      | 1                   | 5    | nA                                     |
| Diode capacitance                   | $V_R = 0 \text{ V}, f = 1 \text{ MHz}, E = 0$                           | $C_D$           |      | 11                  |      | pF                                     |
| Open circuit voltage                | $E_e = 1 \text{ mW/cm}^2, \lambda = 870 \text{ nm}$                     | $V_O$           |      | 450                 |      | mV                                     |
| Short circuit current               | $E_e = 1 \text{ mW/cm}^2, \lambda = 870 \text{ nm}$                     | $I_K$           |      | 50                  |      | $\mu\text{A}$                          |
| Reverse light current               | $E_e = 1 \text{ mW/cm}^2, \lambda = 870 \text{ nm}, V_R = 5 \text{ V}$  | $I_{ra}$        |      | 55                  |      | $\mu\text{A}$                          |
|                                     | $E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_R = 5 \text{ V}$  | $I_{ra}$        | 30   | 60                  |      | $\mu\text{A}$                          |
| Temperature coefficient of $I_{ra}$ | $E_e = 1 \text{ mW/cm}^2, \lambda = 870 \text{ nm}, V_R = 5 \text{ V}$  | $TK_{I_{ra}}$   |      | -0.1                |      | %/K                                    |
| Absolute spectral sensitivity       | $V_R = 5 \text{ V}, \lambda = 870 \text{ nm}$                           | $s(\lambda)$    |      | 0.55                |      | A/W                                    |
| Angle of half sensitivity           |   | $\phi$          |      | $\pm 20$            |      | deg                                    |
| Wavelength of peak sensitivity      |   | $\lambda_p$     |      | 940                 |      | nm                                     |
| Range of spectral bandwidth         |   | $\lambda_{0.5}$ |      | 790 to 1050         |      | nm                                     |
| Quantum efficiency                  | $\lambda = 950 \text{ nm}$  | $\eta$          |      | 70                  |      | %                                      |
| Noise equivalent power              | $V_R = 20 \text{ V}, \lambda = 950 \text{ nm}$                          | NEP             |      | $3 \times 10^{-14}$ |      | W/ $\sqrt{\text{Hz}}$                  |
| Detectivity                         | $V_R = 20 \text{ V}, \lambda = 950 \text{ nm}$                          | $D^*$           |      | $3 \times 10^{12}$  |      | $\text{cm}^2\sqrt{\text{Hz}}/\text{W}$ |
| Rise time                           | $V_R = 50 \text{ V}, R_L = 50 \text{ }\Omega, \lambda = 820 \text{ nm}$ | $t_r$           |      | 2.5                 |      | ns                                     |
| Fall time                           | $V_R = 50 \text{ V}, R_L = 50 \text{ }\Omega, \lambda = 820 \text{ nm}$ | $t_f$           |      | 2.5                 |      | ns                                     |

**Note**

$T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

**BASIC CHARACTERISTICS**

$T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

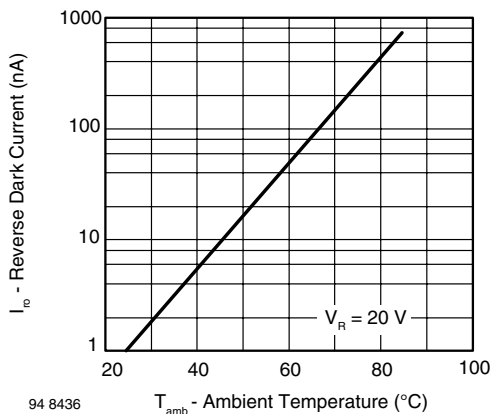


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

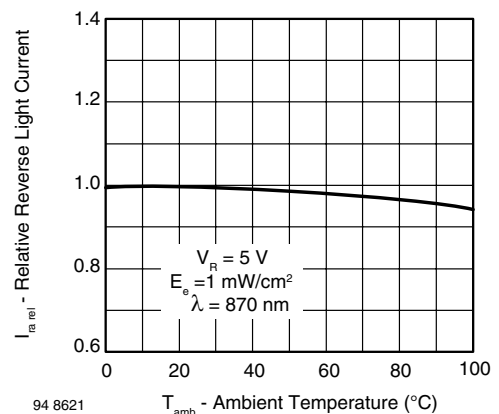


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

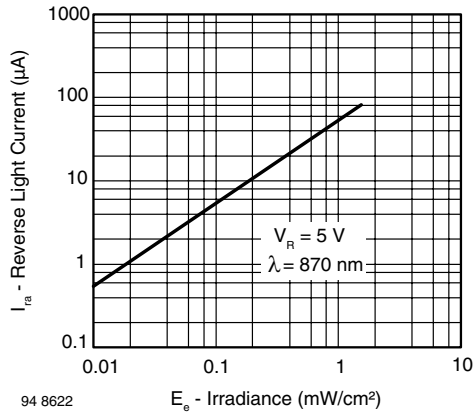


Fig. 3 - Reverse Light Current vs. Irradiance

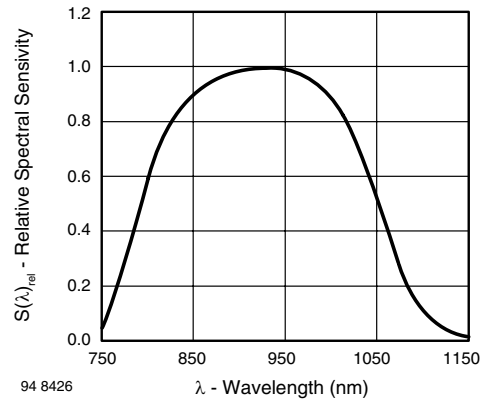


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

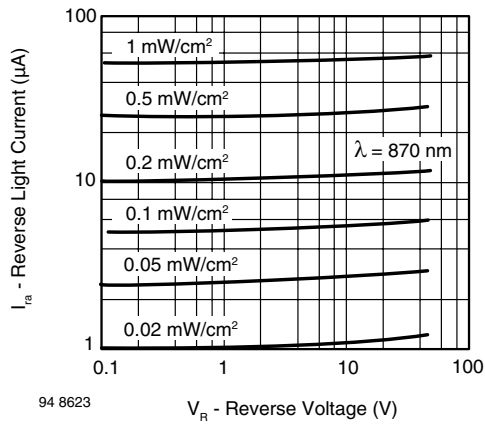


Fig. 4 - Reverse Light Current vs. Reverse Voltage

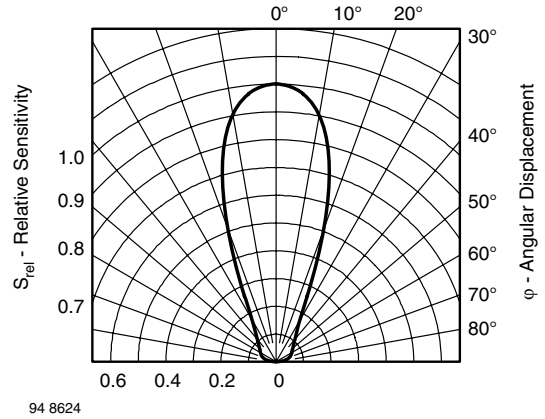


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

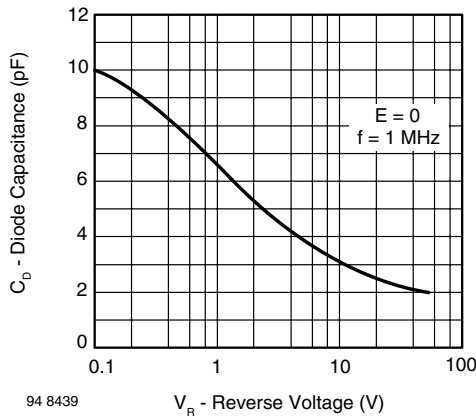
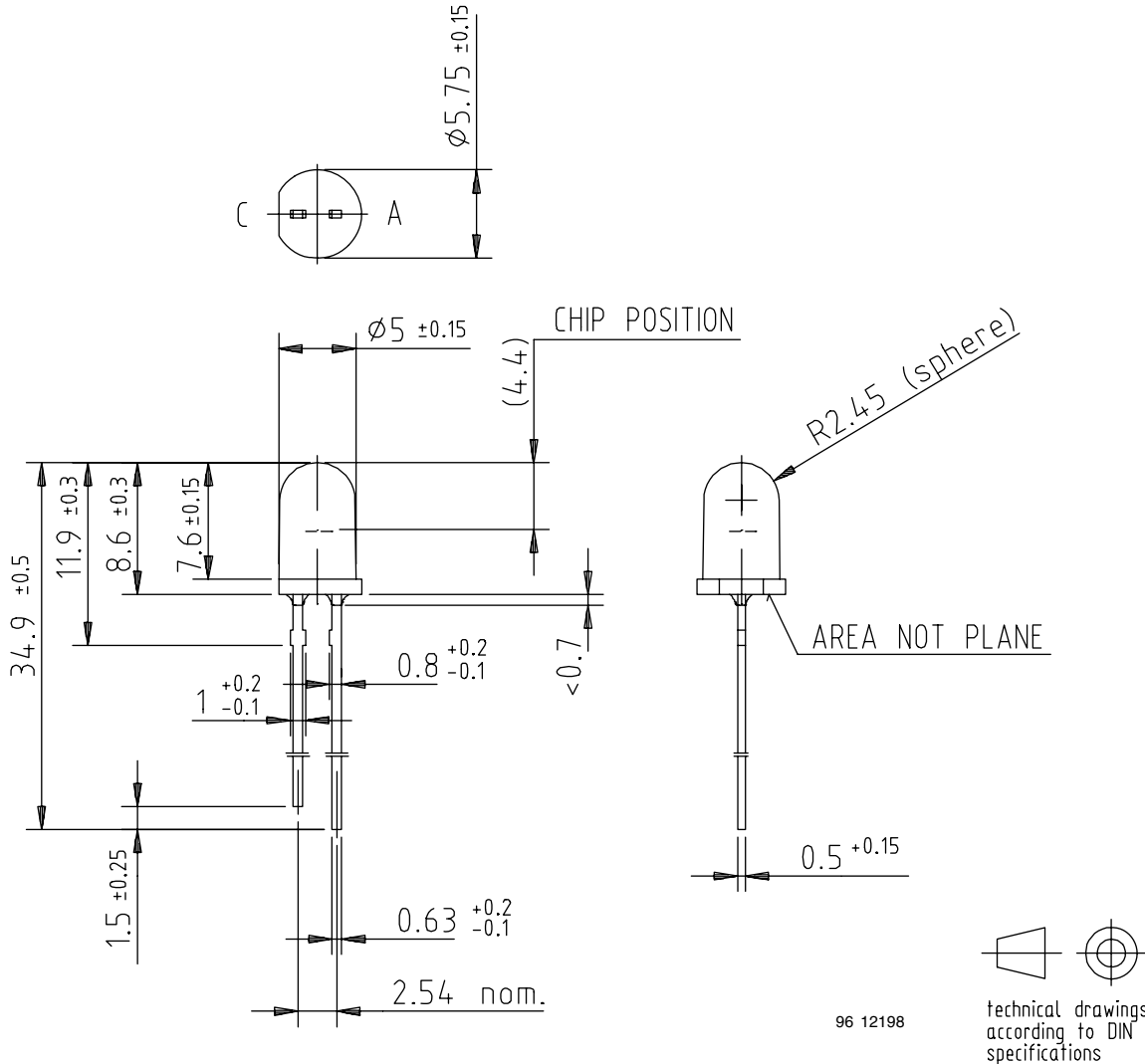


Fig. 5 - Diode Capacitance vs. Reverse Voltage



**PACKAGE DIMENSIONS** in millimeters





## Disclaimer

All product specifications and data are subject to change without notice.

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